

## NOTES, ABSTRACTS, AND REVIEWS.

## NEW MARINE OBSERVATORY IN JAPAN.

Announcement has reached the Weather Bureau of the opening of the new marine observatory at Kobe, Japan, on August 26, last. This institution, which owes its existence to the business men of Kobe, will have for its principal aims researches on meteorological, oceanographical, and nautical subjects. Special attention will be devoted to the Pacific Ocean. Facilities will be provided for the repair and test of navigational instruments.

It is expected that publications of the observatory will be printed in European languages.

## METHOD OF PREPARATION OF MARINE METEOROLOGICAL CHARTS.

The following data give an idea of the work required in preparing the charts showing the weather conditions over the North Atlantic Ocean, that appear in the MONTHLY WEATHER REVIEW. The month of August, 1920, is taken as an example, and the results are based on the forms received up to October 16. A few reports were received after that date, but not enough to change the figures materially.

The number of Forms 1201-M for the month of August received up to date (Oct. 16) from reporting vessels in the North Atlantic Ocean are as follows: July-August, 124; August, 253; August-September, 112. The first and last are known as "split months," and it is assumed that the total number of observations are divided equally between the two months, and one-half of the sum can therefore be considered as August reports. This number is 118, which added to 253 gives 371 as the total number received for the month.

An examination of over 200 forms shows the average number of observations as 9.43, which multiplied by 371 gives the total number as 3,499.

It often happens that a number of vessels are so near the same position at Greenwich mean noon of a certain date that it is impossible to plot more than one of them, although the others may be useful in verifying the observations of the first. A number of observations are rejected on account of unreliable barometric readings, or because they were taken at local noon instead of Greenwich as well as for other reasons. While as stated before 3,499 observations were received, only 2,352, or 67 per cent, were plotted. The daily number of the latter varied considerably, the least being 61 on the 20th and the greatest 87 on the 2d. The means for the three decades of the months were 82, 71, and 74, respectively, and for the entire month 76. About 50 land stations were also plotted daily; these were taken from the United States and British daily weather maps, and the number varied slightly, as observations were sometimes missing.

Taken as a whole, the number of reports shows a gratifying increase during the last two years, especially over the steamer lanes. There are regions, however, in the north, as well as a large portion of the Caribbean Sea, which are seldom heard from, and efforts are being made to obtain the cooperation of shipmasters visiting these waters.—*F. A. Young, Marine Division, U. S. Weather Bureau, Washington, D. C.*

## WANDERING STORMS.

[Reprinted from *Nature*, London, Nov. 4, 1920, p. 321.]

Wandering storms form the subject of an article by Prof. A. McAdie, of Harvard University, in the Geographical Review for July last. The communication is for the most part based on Sir Napier's Shaw's Manual of Meteorology, Part IV, published during the war, which discusses the relation of the wind to barometric pressure and the travel of cyclones. Prof. McAdie instances three unusual storm tracks dealt with by Sir Napier Shaw, and alludes to the need in forecasting of knowledge of recurring storms, with especial reference to the aviator and his long-distance flights. A remarkable instance is given by the author of the erratic travel of a disturbance from May 8 to June 6, 1910. This is tracked from the Strait of Juan de Fuca to the Grand Banks, when it is said to have recurved again and again and to have come back to the continent on May 26. It then merged with a storm that was moving north from Texas, and after meandering about to the east and northeast of Nova Scotia for 10 days, until June 6, the disturbance dissipated.

## PROGRESS OF METEOROLOGY.

By W. H. DINES.

[Abstracted from *Nature*, Nov. 6, 1919, pp. 247-248.]

"The progress of meteorology during the last 50 years has been very marked, as may be seen by a casual reference to the current meteorological literature of the period 1865-1875; to a great extent it resembles the emergence of astronomy as an exact science from the old astrology, but it must be confessed that the Newton of meteorology has not yet appeared."

The article follows the development of the science from the mere seeking for recurrences in the weather, through the applications of the laws of thermodynamics and mechanics of the atmosphere, and finally, perhaps, the somewhat overardent application of mathematics. But the turn is for the better, and the value of mathematics as an aid to meteorological investigation can not be overestimated.

The problem of the meteorologist of middle latitudes has always been in the direction of the genesis of the moving cyclone and anticyclone, and this investigation has led far into the upper air, through the troposphere and into the stratosphere, where interesting and important correlations between temperature and pressure have been obtained. "[Over England] from 1 km. and upward there is a very high correlation, indeed, between temperature and pressure; between 4 and 8 km. the correlation coefficients are more than 0.85; they then fall off rapidly so that there is again no correlation at the boundary between the troposphere and the stratosphere. Above this, in the lower part of the stratosphere, the correlation is negative and reaches  $-.030$ , but falls off with increasing height." To the author's mind, the changes in the temperatures aloft are the results, rather than the causes of the pressure distribution.

In addition to the vast data obtained by sounding balloons, there is also an accumulation of information obtained from pilot balloons, a large part of which has not yet been discussed.

"\* \* \* Meteorologists have good cause for congratulation in the steady progress that is taking place.—*C. L. M.*

## ANNUAL REPORT OF THE BRITISH METEOROLOGICAL COMMITTEE.<sup>1</sup>

[Excerpts reprinted from *Nature*, London, Oct. 21, 1920, pp. 260-261.]

The Report of the Meteorological Committee for the year ending on March 31, last, marks the end of a definite stage in the development of the British Meteorological Service. During the year under review four notable developments occurred: The Office became attached to the Air Ministry instead of being in direct connection with the Treasury; (2) the work of the British Rainfall Organization was incorporated with that of the Office; (3) the coordination of the services of the Navy, Army, and Air Force, which developed during the war, was begun; and (4) inter-Dominion and international cooperation in meteorology, which had largely been in abeyance during the war, save for military purposes, began to take a more definite shape. One might add as a fifth important occurrence that the period of service of Sir Napier Shaw as Director of the Office came to an end at the close of the year, though he consented to remain in office until the appointment of his successor was carried through.

\* \* \* The effect of the war in bringing to light the value of meteorological information is well gauged by the increase of the *personnel* of the Office. In 1914 the Staff of the Office comprised about 20 professional and 60 clerical and technical assistants, while on March 31, 1920, the establishment was 97 professional staff and 278 clerical and technical staff.

The inter-Dominion and international arrangements are still far from being stabilized, but one of the most important developments was a Conference of Dominion meteorologists, which concluded with the following resolution: "That this conference of representative meteorologists of the British Empire assembled together for the first time agree to continue as an association for the exchange of their views from time to time by correspondence upon scientific matters concerning the achievements, requirements, and organization of their services, and hereby elect Sir Napier Shaw their first president, and invite the members to submit rules for the guidance and acceptance of the association."

This conference had been preceded by the international meeting in Brussels of representatives of the scientific academies of the Allies, at which meteorology was amongst the subjects considered. A Geodetic and Geophysical Union was set up, one of its branches being meteorology with Sir Napier Shaw as chairman and Dr. Marvin (of the U. S. Weather Bureau) as secretary. A meeting in Paris followed, summoned by the French Government, at which a new international committee was appointed, with Sir Napier Shaw as president, in continuation of the old committee. A further complication arises out of the convention relating to aerial navigation, which formed part of the work of the Peace Conference, and by Annexe G regulates "the collection and dissemination of statistical, current, and special meteorological information."

What shape international cooperation may ultimately take is sufficiently obscure, but it is satisfactory to know that Sir Napier Shaw, who has been responsible for so

great a development in the past, is to continue to act as president of the new International Committee.—*E. M. W.*

## ANNUAL REPORT OF THE CHIEF OF THE WEATHER BUREAU, 1919-20.

The Weather Bureau is still suffering from the ravages of war and the consequences of a great change in economic conditions. The rehabilitation of the service is now a most urgent need.

The forecast service, in addition to its usual routine, issued special weather forecasts for the Army and Navy balloon race, which started from St. Louis, September 25, 1919; the recruiting tour of the NC-4, which began in September, 1919, and lasted for several months; the trans-continental reliability aeroplane race, which began October 7, 1919. In July, 1919, a new form of forecasts, known as "Flying weather" was begun at the request of the War Department. Later this service was extended to the Post Office Department as an aid to the mail-route aviators.

In order to show the verification of the forecasts, a table is given in the Report. This table covers the five years, 1915-1919, inclusive, for each of the five forecast districts into which the United States is divided, and shows the percentage of verification of the a. m. 36-hour weather and temperature forecasts.<sup>1</sup>

Throughout the year cooperation with the Army and the Navy meteorological services has been not only maintained, but has been rendered considerably more effective than heretofore.

Owing to the growing importance of marine meteorology, the marine section of the Climatological Division of the Bureau was organized into a separate division on April 1, 1920.

The Report also contains information on the Bureau's work in the growing highway weather service, weather maps, river and flood warnings, mountain snowfall measurements, fruit frost-work, solar radiation investigations, instrumentations, seismology, and volcanology.

## COMPOSITION OF THE ATMOSPHERE.<sup>2</sup>

By A. KROGH.

[Reprinted from *Science Abstracts*, Sect. A, Aug. 31, 1920, § 1042.]

Within the apparatus briefly described absolute determinations of CO<sub>2</sub>, O, "N" (N+inert gases), and combustible gases may be made with an accuracy of 0.001 per cent. The percentage of combustible gases (whether hydrogen or not) is found to be below 0.0005 per cent and probably below 0.0002 per cent, much less than the commonly assumed value 0.003 per cent. "N" is very nearly constant, observed variations from the average being less than 0.003 per cent, and it is claimed that the average "N" percentage in the troposphere is a geophysical constant which can be ascertained within 0.001 per cent. Two analyses give the absolute composition at the surface as 0.030 per cent CO<sub>2</sub>, 79.022 per cent "N" and 29.948 per cent O. In the streets of Copenhagen the CO<sub>2</sub> percentage is usually increased by 0.001-0.007 per cent above the normal 0.030 per cent, there being at the same time a deficit of oxygen. The author urges a thorough study, by the methods developed, of the composition of atmospheric air, including samples from great heights. The paper is printed in English.—*M. A. Giblett.*

<sup>1</sup> Fifteenth Annual Report of the Meteorological Committee to the Lords Commissioners of His Majesty's Treasury for the Year ended March 31, 1920. Pp. 88. (Cmd. 948) (London: H. M. Stationery Office, 1920.) Price 9d. net.

<sup>1</sup> A discussion of this table, as well as extensive excerpts from the report, appears in the Bulletin of the American Meteorological Society for November, 1920, pp. 127-134.

<sup>2</sup> K. Danske Vidensk. Selskab. 1, No. 12, pp. 1-19, 1919.